21 September 2017
[25–17]

Call for submissions – Application A1136

Protein Glutaminase as a Processing Aid (Enzyme)

FSANZ has assessed an Application made by Amano Enzyme Inc. to permit the use of protein glutaminase, a food enzyme of microbial origin, as a processing aid in the manufacture of proteinaceous foods and has prepared a draft food regulatory measure. Pursuant to section 31 of the *Food Standards Australia New Zealand Act 1991* (FSANZ Act), FSANZ now calls for submissions to assist consideration of the draft food regulatory measure.

For information about making a submission, visit the FSANZ website at information for submitters.

All submissions on applications and proposals will be published on our website. We will not publish material that that we accept as confidential, but will record that such information is held. In-confidence submissions may be subject to release under the provisions of the *Freedom of Information Act 1991*. Submissions will be published as soon as possible after the end of the public comment period. Where large numbers of documents are involved, FSANZ will make these available on CD, rather than on the website.

Under section 114 of the FSANZ Act, some information provided to FSANZ cannot be disclosed. More information about the disclosure of confidential commercial information is available on the FSANZ website at information for submitters.

Submissions should be made in writing; be marked clearly with the word 'Submission' and quote the correct project number and name. While FSANZ accepts submissions in hard copy to our offices, it is more convenient to receive submissions electronically through the FSANZ website via the link on documents for public comment. You can also email your submission directly to submissions@foodstandards.gov.au.

There is no need to send a hard copy of your submission if you have submitted it by email or via the FSANZ website. FSANZ endeavours to formally acknowledge receipt of submissions within 3 business days.

DEADLINE FOR SUBMISSIONS: 6pm (Canberra time) 2 November 2017

Submissions received after this date will not be considered unless an extension had been given before the closing date. Extensions will only be granted due to extraordinary circumstances during the submission period. Any agreed extension will be notified on the FSANZ website and will apply to all submitters.

Questions about making submissions or the application process can be sent to standards.management@foodstandards.gov.au.

Hard copy submissions may be sent to one of the following addresses:

Food Standards Australia New Zealand
PO Box 5423
KINGSTON ACT 2604
AUSTRALIA
Tel +61 2 6271 2222

Food Standards Australia New Zealand
PO Box 10559
The Terrace WELLINGTON 6143
NEW ZEALAND
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Table of contents

Supporting document

The following documents which informed the assessment of this Application are available on the FSANZ website:

SD1 Technical and risk assessment

Executive summary

Amano Enzyme Inc. (Amano) has submitted an Application seeking permission to use an enzyme, protein glutaminase sourced from *Chryseobacterium proteolyticum,* as a processing aid in the manufacture of certain food products.

Protein glutaminase enhances protein solubility in various applications such as baking, pasta/noodle making, milk, dairy meat, fish, grain processing, yeast products and egg based products. The technological purpose is to improve emulsification, foam stabilisation and gelling in these proteinaceous foods. It also decreases flavour fade or 'off flavour' problems associated with flavour-protein interactions.

Enzymes used in the production and manufacture of food are considered processing aids and are regulated by Schedule 18 of the *Australia New Zealand Food Standards Code* (the Code). Permitted enzymes of microbial origin are listed in the Table to subsection S18—4(5) of the Code.

The safety data submitted by Amano in support of the Application was only for protein glutaminase sourced from one particular non GM strain of *Chryseobacterium proteolyticum* (i.e., *Chryseobacterium proteolyticum* strain AE-PG). FSANZ therefore only assessed protein glutaminase sourced from that particular strain.

After undertaking a risk assessment, FSANZ concludes that there are no public health and safety issues associated with the use as a food processing aid of protein glutaminase sourced from *Chryseobacterium proteolyticum* strain AE-PG.

FSANZ is satisfied that that enzyme's use as a processing aid in the manner specified in the Application is technologically justified. FSANZ also concludes that, as the enzyme performs its technological purpose during processing and manufacture of food only, it is appropriately categorised as a processing aid rather than a food additive. The proposed maximum permitted level is GMP.

The enzyme also complies with the internationally accepted Joint Expert Committee on Food Additives (JECFA) specifications for chemical and microbiological purity.

FSANZ has therefore prepared a draft variation to permit the use as a processing aid of protein glutaminase sourced from *Chryseobacterium proteolyticum* strain AE-PG.

1 Introduction

1.1 The Applicant

The Applicant is Amano Enzyme Inc. (Amano), a company that produces specialty enzymes for the food industry, pharmaceuticals and diagnostic medicines.

1.2 The Application

The purpose of the Application is to obtain permission to use an enzyme, protein glutaminase sourced from *Chryseobacterium proteolyticum,* as a processing aid in the manufacture of certain food products.

Protein glutaminase benefits food manufacturers by enhancing protein solubility in various applications such as baking and pasta/noodle making and the processing of milk, dairy, meat, fish, grain, yeast products and egg-based products. The technological purpose is to improve emulsification, foam stabilisation and gelling in proteinaceous foods. It also decreases flavour fade or 'off flavour' problems associated with flavour-protein interactions.

1.3 The current standard

Enzymes used in processing and manufacturing food are considered processing aids.

Paragraph 1.1.1—10(6)(c) of the *Australia New Zealand Food Standards Code* (the Code) provides that a food for sale must not have, as an ingredient or a component, a substance that is used as a processing aid, unless expressly permitted. Section 1.1.2—13 of the Code defines the expression 'used as a processing aid'. That definition imposes certain requirements on substances permitted by Standard 1.3.3 and Schedule 18 to be used as a processing aid, such that it does not perform a technological function in the final food for sale.

Standard 1.3.3 and Schedule 18 of the Code list the permitted processing aids. Enzymes of microbial origin permitted to be used as processing aids are listed in the table to subsection S18—4(5) or in the table to subsection S18—9(3).

Protein glutaminase sourced from *Chryseobacterium proteolyticum* is currently not listed in Schedule 18. Therefore, its use as a processing aid is not permitted.

1.4 International Standards

The Codex Alimentarius does not establish standards for processing aids or for enzymes.

Individual countries regulate the use of enzymes differently to the Code. The enzyme preparation has been approved for use in food production in France and the USA.

There are internationally recognised specifications for enzymes. These enzyme specifications are established by the Joint FAO/WHO Expert Committee on Food Additives (JECFA 2006) and the Food Chemicals Codex (Food Chemicals Codex 2014).

1.5 Reasons for accepting Application

The Application was accepted for assessment because:

- it complied with the procedural requirements under subsection 22(2) of the FSANZ Act

- it related to a matter that warranted the variation of a food regulatory measure.

1.6 Procedure for assessment

The Application is being assessed under the General Procedure.

2 Summary of the assessment

2.1 Risk assessment

2.2.1 Enzyme and source microorganism nomenclature

The International Union of Biochemistry and Molecular Biology (IUBMB), the internationally recognised authority for enzyme nomenclature, uses the name "protein-glutamine glutaminase" for enzymes with an EC number of 3.5.1.44 (IUBMB 2017).

C. proteolyticum is not listed in the Code as a permitted processing aid. Nor are any strains of that species.

The species *C. proteolyticum* is not an approved bacterial name with standing in nomenclature, although Yamaguchi and Yokoe (2000) proposed that a new species with the name *C. proteolyticum* sp. nov. strain 9670 be designated as the type strain. The study by Yamaguchi and Yokoe (2000) described two strains (9670 and 9671), isolated from soil in Japan, for which DNA–DNA relatedness data and 16S rRNA sequence analysis indicated that the strains belong to the genus *Chryseobacterium*, but not to an already described species. The type strain, 9670, has been deposited in the Patent Microorganism Depository, National Institute of Bioscience and Human Technology (Tsukuba, Japan), as strain FERM P-17664 (Yamaguchi S, Yokoe, M 2000).

The Application included safety data for *C. proteolyticum* strain 9670 and the production strain AE-PG, which was derived from strain 9670 through chemical mutagenesis. While strain 9670 and AE-PG present no safety issues, there is currently insufficient evidence to assess the safety of *C. proteolyticum* at the species level as it is a novel bacterium with no other strains characterised or described in the scientific literature. This is consistent with the determination of the EFSA Panel on Biological Hazards, which recently recommended that *C. proteolyticum* was not suitable for inclusion on the list of microorganisms with a Qualified Presumption of Safety due to an insufficient body of evidence as all available safety studies refer to a single strain (EFSA 2016).

2.2.2 Safety assessment

There are no public health and safety concerns associated with the use of protein glutaminase from *C. proteolyticum* strain AE-PG as a food processing aid, based on the following considerations:

- *C. proteolyticum* strain AE-PG is not pathogenic or toxigenic
- protein glutaminase from *C. proteolyticum* strain AE-PG was not genotoxic *in vitro*
- the no observed adverse effect level (NOAEL) in a 13-week repeated dose oral toxicity study in rats was the highest dose tested and corresponds to 2538 mg/kg bw/day or 92.8 mg TOS/kg bw/day. This is more than 200-fold higher than the Applicant's estimate of an individual's theoretical maximal daily intake (0.38 mg TOS/kg bw/day) based on the proposed uses, as stated in the Application
- protein glutaminase from *C. proteolyticum* strain AE-PG does not have the characteristics of a potential food allergen and ingestion of any residual protein glutaminase in food products is unlikely to pose an allergenicity concern.

2.2.3 Risk assessment conclusion

Based on the reviewed toxicological data and the absence of any identifiable hazard, an Acceptable Daily Intake 'not specified' is appropriate. A dietary exposure assessment was therefore not required.

It is concluded that there are no safety concerns associated with the use of this enzyme as a food processing aid.

2.3 Risk management

2.3.1 Enzyme and source microorganism nomenclature considerations

As there is currently insufficient evidence to assess the safety of *C. proteolyticum* at the species level, FSANZ proposes to permit the use of protein glutaminase from *C. proteolyticum* strain AE-PG as a processing aid. For that reason, Schedule 18 of the Code should specify that particular strain as the source microorganism.

2.3.2 Labelling considerations

As a general rule, processing aids are exempt from the requirement to be declared in the statement of ingredients in accordance with paragraphs 1.2.4—3(2)(d) and (e) in Standard 1.2.4.

The risk assessment is that there are no public health and safety risks from the use of this enzyme as a food processing aid. Therefore, the general exemption from declaration of processing aids in the statement of ingredients will apply to foods produced using this enzyme as a processing aid and no additional labelling requirements are proposed.

2.3.3 Risk management conclusion

As processing aids require permissions in the Code, the main risk management option available to FSANZ is to approve or reject the request to amend the Code, and impose any conditions that may be appropriate.

Taking into account the risk assessment, the enzyme nomenclature and labelling considerations, the risk management conclusion is to permit protein glutaminase (EC 3.5.1.44) sourced from *Chryseobacterium proteolyticum* strain AE-PG.

The permitted technological purpose of that enzyme will be to deamidate proteins during the manufacture and/or processing of the following types of food:
(a) baked products
(b) pasta
(c) noodles
(d) milk
(e) other dairy products
(f) meat
(g) fish
(h) grains
(i) yeast
(j) egg based products.

In the absence of any public health or safety concerns identified by the risk assessment, addition will be in accordance with GMP.

2.4 Risk communication

2.4.1 Consultation

Consultation is a key part of FSANZ's standards development process. FSANZ developed and applied a basic communication strategy to this Application. All calls for submissions are notified via the Food Standards Notification Circular, media release, FSANZ's social media tools and Food Standards News.

The process by which FSANZ considers standard development matters is open, accountable, consultative and transparent. Public submissions are called to obtain the views of interested parties on issues raised by the Application and the impacts of regulatory options. FSANZ acknowledges the time taken by individuals and organisations to make submissions on this Application.

The draft variation will be considered for approval by the FSANZ Board taking into account public comments received from this call for submissions.

2.4.2 World Trade Organization (WTO)

As members of the World Trade Organization (WTO), Australia and New Zealand are obliged to notify WTO members where proposed mandatory regulatory measures are inconsistent with any existing or imminent international standards and the proposed measure may have a significant effect on trade.

There are no relevant international standards for enzymes and amending the Code to permit the use of the enzyme protein glutaminase from a new source microorganism for use as a processing aid is unlikely to have a significant effect on international trade as the enzyme preparation complies with international specifications for food enzymes. Therefore, a notification to the WTO under Australia's and New Zealand's obligations under the WTO Technical Barriers to Trade or Application of Sanitary and Phytosanitary Measures Agreement was not considered necessary.

2.5 FSANZ Act assessment requirements

When assessing this Application and the subsequent development of a food regulatory measure, FSANZ has had regard to the following matters in section 29 of the FSANZ Act:

2.5.1 Section 29

2.5.1.1 Consideration of costs and benefits

FSANZ is required to consider the impact of various regulatory and non-regulatory options on all sectors of the community, especially relevant stakeholders who may be affected by this Application. The costs and benefits associated with the proposed amendments to the Code are analysed using regulatory impact principles. The level of analysis is commensurate with the nature of the Application and significance of the impacts.

Two regulatory options were considered:

(1) prepare a draft variation to Schedule 18 to permit the use of the protein glutaminase (EC 3.5.1.44) sourced from *Chryseobacterium proteolyticum* strain AE-PG as a processing aid;

(2) reject the Application.

The Office of Best Practice Regulation, in a letter dated 24 November 2010 (reference 12065), provided a standing exemption from the need to assess if a Regulation Impact Statement is required for Applications relating to processing aids, as they are machinery in nature and their use is voluntary. However, FSANZ undertook a limited impact analysis.

A consideration of the costs and benefits of the regulatory options was not intended to be an exhaustive, quantitative economic analysis of the options and, in fact, most of the effects that were considered cannot be assigned a dollar value.

Rather, the assessment sought to highlight the qualitative effects of criteria that were relevant to each option. These criteria are deliberately limited to those involving broad areas such as trade, consumer information and compliance.

Option 1 – Prepare a draft variation

Sector	Costs or benefits to sector
Consumers	Consumers may benefit from foods having improved texture or flavour. The overall benefits to consumers include: • choice of an additional range of food products that become available due to the use of enzyme by Australian and New Zealand manufacturers; and • access to products manufactured using enzyme that are currently manufactured overseas. There are no additional costs to consumers associated with this option.
Industry	Protein glutaminase benefits food manufacturers by enhancing protein solubility in various applications such as baking, pasta/noodle making, milk, dairy, meat, fish, grain processing and manufacture of yeast products and egg-based products. The functionality that protein glutaminase provides is an improvement in emulsification, foam stabilisation and gelling. It can also decrease flavour fade or 'off flavour' problems associated with flavour-protein interactions. Its use by industry is voluntary therefore it will only be used where industry believe a net benefit exists above using existing manufacturing processes.
Governments	There may be a cost to government in terms of monitoring and compliance. There are no other costs or benefits to governments associated with this option.

Option 2 – Reject the Application

Sector	Costs or benefits to sector
Consumers	Consumers may have access to a smaller range of products. There are no other costs or benefits to consumers of this option.
Industry	There are no benefits to industry from this option. The enzyme preparation has already been permitted for use overseas (see above). Therefore, there is a potential cost to the manufacturer of this enzyme preparation, as well as to overseas food manufacturers and importers, in that they will be unable to expand the international trade of their enzyme preparation and products made using this enzyme preparation, respectively, to Australia/New Zealand.
Governments	Potential costs to government in terms of monitoring and compliance would be avoided. There are no other benefits or costs to governments for this option.

The direct and indirect benefits that would arise from a food regulatory measure developed or varied as a result of the Application outweighed the costs to the community, Government or industry that would arise from the development or variation of the food regulatory measure. Therefore, the preferred option was to prepare a draft variation to Schedule 18 of the Code.

2.5.1.2 Other measures

There are no other measures (whether available to FSANZ or not) that would be more cost-effective than a food regulatory measure developed or varied as a result of the Application.

2.5.1.3 Any relevant New Zealand standards

Standards 1.1.1, 1.1.2 and 1.3.3; and Schedule 18 apply in both Australia and New Zealand. There are no other relevant New Zealand Standards.

2.5.1.4 Any other relevant matters

Other relevant matters are considered below.

2.5.2. Subsection 18(1)

FSANZ has also considered the three objectives in subsection 18(1) of the FSANZ Act during the assessment.

2.5.2.1 Protection of public health and safety

FSANZ has undertaken a hazard assessment (SD1), summarised in section 3.9 and concluded there are no public health and safety concerns relating to permitting the enzyme protein glutaminase sourced from *C. proteolyticum* strain AE-PG as a processing aid.

2.5.2.2 The provision of adequate information to enable informed consumer choice

No issues have been identified. The labelling requirements for processing aids are discussed in Section 2.3.2 – Labelling considerations.

2.5.2.3 The prevention of misleading or deceptive conduct

There are no issues identified with this Application relevant to this objective.

2.5.3 Subsection 18(2) considerations

FSANZ has also had regard to:

- **the need for standards to be based on risk analysis using the best available scientific evidence**

FSANZ has used the best available scientific evidence to conduct the risk analysis, which is provided in SD1. The Applicant submitted a dossier of scientific studies as part of their Application. Other technical information, including scientific literature, was also used in assessing the Application.

- **the promotion of consistency between domestic and international food standards**

There are no Codex Alimentarius standards for enzymes. However, this enzyme is permitted for use in France and the USA. It also meets international specifications for enzyme

preparations, being the JECFA Compendium of Food Additive Specifications and the Food Chemicals Codex.

- **the desirability of an efficient and internationally competitive food industry**

Granting permission for this enzyme provides food manufacturers with an improvement in functionality when processing proteinaceous foods.

- **the promotion of fair trading in food**

No issues were identified for this Application relevant to this objective.

- **any written policy guidelines formulated by the Forum on Food Regulation**

The Ministerial Policy Guideline Addition to Food of Substances other than Vitamins and Minerals[1] includes specific order policy principles for substances added to achieve a solely technological function, such as processing aids. These specific order policy principles state that permission should be granted where:

- the purpose for adding the substance can be articulated clearly by the manufacturer as achieving a solely technological function (i.e. the 'stated purpose')
- the addition of the substance to food is safe for human consumption
- the amounts added are consistent with achieving the technological function
- the substance is added in a quantity and a form which is consistent with delivering the stated purpose
- no nutrition, health or related claims are to be made in regard to the substance.

FSANZ has determined that permitting the use of the enzyme protein glutaminase from *C. proteolyticum* strain AE-PG as a processing aid is consistent with the specific order principles for 'Technological Function'.

3 Draft variation

The draft variation to the Code is at Attachment A and is intended to take effect on gazettal.

A draft explanatory statement is at Attachment B. An explanatory statement is required to accompany an instrument if it is lodged on the Federal Register of Legislation.

4 References

EFSA (2016) Update of the list of QPS-recommended biological agents intentionally added to food or feed as notified to EFSA 4: suitability of taxonomic units notified to EFSA until March 2016. EFSA Journal.14 (7):4522. Accessed 29 June 2017

Food Chemicals Codex 9th Edition (2014), The United States Pharmacopeia, United States Pharmacopeial Convention, Rockville, MD. Accessed 28 June 2017

IUBMB 2017 (International Union of Biochemistry and Molecular Biology) Enzyme Nomenclature for EC 3.5.1.44 Accessed. 28 June 2017

JECFA (2006) General specifications and considerations for enzyme preparations used in food processing. Accessed 28 June 2017

[1] Ministerial Guideline

Yamaguchi, S. and Yokoe, M. (2000) A Novel Protein-Deamidating Enzyme from *Chryseobacterium proteolyticum* sp. nov., a Newly Isolated Bacterium from Soil. Applied and Environmental Microbiology. 66(8):3337-3343. Accessed 29 June 2017

Attachments

A. Draft variation to the *Australia New Zealand Food Standards Code*
B. Draft Explanatory Statement

Attachment A – Draft variation to the *Australia New Zealand Food Standards Code*

Food Standards (Application A1136 – Protein Glutaminase as a Processing Aid (Enzyme)) Variation

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The Board of Food Standards Australia New Zealand gives notice of the making of this variation under section 92 of the *Food Standards Australia New Zealand Act 1991*. The variation commences on the date specified in clause 3 of this variation.

Dated [To be completed by Standards Management Officer]

Standards Management Officer
Delegate of the Board of Food Standards Australia New Zealand

Note:

This variation will be published in the Commonwealth of Australia Gazette No. FSC XX on XX Month 20XX. This means that this date is the gazettal date for the purposes of clause 3 of the variation.

1 Name

This instrument is the *Food Standards (Application A1136 – Protein Glutaminase as a Processing Aid (Enzyme)) Variation*.

2 Variation to a standard in the *Australia New Zealand Food Standards Code*

The Schedule varies a Standard in the *Australia New Zealand Food Standards Code*.

3 Commencement

The variation commences on the date of gazettal.

Schedule

[1] **Schedule 18** is varied by inserting into the table to subsection S18—9(3) in alphabetical order

Protein glutaminase (EC 3.5.1.44) sourced from *Chryseobacterium proteolyticum* strain AE-PG	To deamidate proteins during the manufacture and/or processing of the following types of food: (a) baked products; (b) pasta; (c) noodles; (d) milk; (e) other dairy products; (f) meat; (g) fish; (h) grains; (i) yeast; and (j) egg based products.	GMP

Attachment B – Draft Explanatory Statement

1. Authority

Section 13 of the *Food Standards Australia New Zealand Act 1991* (the FSANZ Act) provides that the functions of Food Standards Australia New Zealand (the Authority) include the development of standards and variations of standards for inclusion in the *Australia New Zealand Food Standards Code* (the Code).

Division 1 of Part 3 of the FSANZ Act specifies that the Authority may accept applications for the development or variation of food regulatory measures, including standards. This Division also stipulates the procedure for considering an application for the development or variation of food regulatory measures.

FSANZ accepted Application A1136 which seeks to permit the use of protein-glutaminase from *C. proteolyticum* as a processing aid to deamidate proteins during the manufacture and/or processing of foods such asin baked products, noodles, milk, dairy, meat, fish, grains, and yeast products and egg based products. The Authority considered the Application in accordance with Division 1 of Part 3 and has prepared a draft variation to the Code.

2. Purpose

The purpose of this amendment is to permit the use of the enzyme protein glutaminase sourced from *C. proteolyticum* strain AE-PG as a processing aid to deamidate proteins during the manufacture and/or processing of foods such as baked products, noodles, milk, dairy, meat, fish, grains, yeast and egg based products, at GMP. This requires an addition to the table to subsection S18—9(3) in Schedule 18.

3. Documents incorporated by reference

The variations to food regulatory measures do not incorporate any documents by reference.

4. Consultation

In accordance with the procedure in Division 1 of Part 3 of the FSANZ Act, the Authority's consideration of Application A1136 will include one round of public consultation following an assessment and the preparation of a draft Standard and associated assessment summary.

The Office of Best Practice Regulation, in a letter dated 24 November 2010 (reference 12065), provided a standing exemption from the need to assess if a Regulation Impact Statement is required for Applications relating to processing aids, as such Applications are machinery in nature and their use is voluntary.

5. Statement of compatibility with human rights

This instrument is exempt from the requirements for a statement of compatibility with human rights as it is a non-disallowable instrument under section 94 of the FSANZ Act.

6. Variation

The variation inserts a new entry into the table to subsection S18—9(3) in Schedule 18. The new entry would permit the use of the enzyme, protein glutaminase (EC number 3.2.1.8), derived from *Chryseobacterium proteolyticum* strain AE-PG, as a processing aid in food for the technological purposes specified in that entry.